

ABSTRACT OF THE DISCLOSURE

Electrode active materials comprising lithium or other alkali metals, a transition metal, and a phosphate or similar moiety, of the formula:



wherein

- (a) A is selected from the group consisting of Li, Na, K, and mixtures thereof, and $0 < a < 1.0$ and $0 \leq x \leq 1$;
- (b) M comprises one or more metals, comprising at least one metal which is capable of undergoing oxidation to a higher valence state, where $0 < b \leq 2$; and

wherein M, a, b, and x are selected so as to maintain electroneutrality of said compound.

In a preferred embodiment, M comprises at least one transition metal selected from Groups 4 to 11 of the Periodic Table. In another preferred embodiment, M comprises $M'_cM''_d$, where M' is at least one transition metal from Groups 4 to 11 of the Periodic Table; and M'' is at least one element from Groups 2, 3, 12, 13, or 14 of the Periodic Table, and $c + d = b$. Preferably, $0.1 \leq a \leq 0.8$. Preferred embodiments include those having a structure similar to the mineral olivine (herein "olivines"). This invention also provides electrodes comprising an electrode active material of this invention, and batteries that comprise a first electrode having an electrode active material of this invention; a second electrode; and an electrolyte.

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